

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1 – 28 (Canceled)

29. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity (22) and cardiac sounds (20), wherein said identifying comprises:
  - 1. collecting at least said cardiac sounds (20) by the means of at least one microphone;
  - 2. separating said cardiac sounds (20) apart from the sounds related to said respiratory activity (22), by the means of a signal conditioning module (28);
- temporally segmenting said respiratory and said cardiac sounds to express the segments of physiological rhythmicity, by the means of a feature extraction module (30);
- extracting stable features of the heart sounds with respect to their timing in the respiratory cycle, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module (32);
- averaging the features of segments- of heart sounds with respect to the corresponding respiratory cycle; wherein the averaging results in —whilst—averages in which preserving the temporal variability- of said segments is preserved;
- determining the extent of temporal variability ~~of—in~~ groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a

synchronized stable sound relative to a baseline, by the means of a temporal segmentation and feature parameter extraction module (34)-.

30. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient as in claim 29, said method used for synchronizing a heartbeat synchronized system, said analyzing based on the information derived from the group of items consisting of: heart sounds amplitude, interval between them, amplitude and frequency content, and any combination thereof.

31. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity (22) and cardiac sounds (20), wherein said identifying comprises:
  1. collecting at least said cardiac sounds (20) by the means of at least one microphone;
  2. separating said cardiac sounds (20) apart from the sounds related to said respiratory activity (22), by the means of a signal conditioning module (28);
- ~~identifying the respiratory activity and cardiac sounds;~~
- temporally segmenting respiratory sounds and sounds and cardiac electrocardiographic signals to express the segments of physiological rhythmicity, by the means of a feature extraction module (30)-;
- extracting stable features of the heart sounds with respect to their timing in the electrocardiographic signals, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module (32);
- averaging the features of segments of heart sounds with respect to the corresponding electrocardiographic signals whilst preserving the temporal variability of said segments; wherein the averaging results in averages in which the temporal variability of said segments is preserved;
- determining the extent of temporal variability of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline, by the

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means of a temporal segmentation and feature  
parameter extraction module (34).

**Non-Marked version of the Claims**

1 – 28 (Canceled)

29. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity (22) and cardiac sounds (20), wherein said identifying comprises:
  1. collecting at least said cardiac sounds (20) by the means of at least one microphone;
  2. separating said cardiac sounds (20) apart from the sounds related to said respiratory activity (22), by the means of a signal conditioning module (28);
- temporally segmenting said respiratory and said cardiac sounds to express the segments of physiological rhythmicity, by the means of a feature extraction module (30);
- extracting stable features of the heart sounds with respect to their timing in the respiratory cycle, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module (32);
- averaging the features of segments of heart sounds with respect to the corresponding respiratory cycle; wherein the averaging results in averages in which the temporal variability of said segments is preserved;
- determining the extent of temporal variability in groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline, by the means of a temporal segmentation and feature parameter extraction module (34).

30. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient as in claim 29, said method used for

synchronizing a heartbeat synchronized system, said analyzing based on the information derived from the group of items consisting of: heart sounds amplitude, interval between them, amplitude and frequency content, and any combination thereof.

31. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity (22) and cardiac sounds (20), wherein said identifying comprises:
  1. collecting at least said cardiac sounds (20) by the means of at least one microphone;
  2. separating said cardiac sounds (20) apart from the sounds related to said respiratory activity (22), by the means of a signal conditioning module (28);
- temporally segmenting respiratory sounds and cardiac electrocardiographic signals to express the segments of physiological rhythmicity, by the means of a feature extraction module (30);
- extracting stable features of the heart sounds with respect to their timing in the electrocardiographic signals, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module (32);
- averaging the features of segments of heart sounds with respect to the corresponding electrocardiographic signals whilst preserving the temporal variability of said segments; wherein the averaging results in averages in which the temporal variability of said segments is preserved;
- determining the extent of temporal variability of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline, by the means of a temporal segmentation and feature parameter extraction module (34).